



# CALIFORNIA STATE BOARD OF EDUCATION

Item 19

## MAY 2003 AGENDA

SUBJECT	X	ACTION
		INFORMATION
		PUBLIC HEARING
California K-12 Education Technology Master Plan		

### Recommendation:

Approve the Commission on Technology in Learning's *California K-12 Education Technology Master Plan* as the State Master Plan for Education Technology.

### Summary of Previous State Board of Education Discussion and Action

The *California K-12 Education Technology Master Plan* was presented for information only at the February 2003 Board meeting

### Summary of Key Issue(s)

The Commission on Technology in Learning (CTL) was established by AB 598 (Soto) as an advisory body to the State Board and developed the attached document prior to sunset on January 1, 2003.

The *California K-12 Education Technology Master Plan* is presented for Board approval. The Department recommends the Board:

- Approve this document as the State's Master Plan for Education Technology, replacing the 1996 California Education Technology Master Plan titled, *Connect, Compute and Compete*, as California's vision for education technology. After approval, CDE will post the document on the department's website.
- Consider slightly modifying Recommended Action #7 to state, "The State should **consider developing** information and technology literacy standards for all students at every grade level, and as an interim step, may consider the adoption of the International Society for Technology in Education (ISTE) Nation Education technology Standards (NETS)". This modified recommendation appears to be more consistent with the Board's position that technology is an instructional tool, but not a content area, which would require standards.

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**Summary of Key Issue(s)**

The purpose of the Master Plan is to provide a vision for the state on how to effectively use and support education technology to improve student achievement of the Academic Content Standards. The Master Plan sets state-level goals and benchmarks for education technology integration by the year 2008 and includes 25 recommended actions that support technology use goals in three areas: 1) Curriculum, Instruction, and Assessment; 2) Professional Development; and 3) Infrastructure.

As a companion to the Master Plan document, CDE also plans to post a collection of “Promising Practices of Technology Integration” on the CDE Education Technology Office website. The CTL collected examples of effective integration of technology in local education communities while developing the Master Plan. CDE will expand and update this collection using a submission process and selection criteria to be developed with input from the field.

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**Fiscal Analysis (as appropriate)**

None

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**Attachment(s)**

[Attachment 1:](#) Commission on Technology in Learning’s *California K-12 Education Technology Master Plan* (Pages 1-43)

***DRAFT DOCUMENT***

# **California K-12 Education Technology Master Plan**

Developed by the  
**Commission on Technology in Learning**

Approved by the  
Commission on Technology in Learning  
December 13, 2002

Presented to the California State Board of Education  
February and May 2003

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**Finally, the Commission would like to thank the numerous individuals who provided input to the development of this document by presenting public testimony at Commission meetings during public input sessions and submitting written comments on various drafts of the document.**



## Executive Summary

An aspiring teacher once told me, “I want to teach because I want to touch the future everyday.” She knew what many prefer to ignore; that our future is dependent upon the quality of our educational system and how well prepared our children are to become adults and be productive, contributing citizens. While we succeed in ensuring a promising future for some, we are failing far too many.

The Commission for Technology in Learning was created out of this concern for closing the achievement gap and providing access for all children to the knowledge and skills required to sustain the growth and prosperity we have come to expect as Californians. AB 598, Soto carried a clear message, technology is basic to a 21<sup>st</sup> Century educational system, and **all** our children should have access to it. The Commission began first with the development of Technology Planning Guidelines for School Districts. These guidelines prepared with extensive input from state, county and district administrators and technology planning experts provide a rubric for assessing and planning for continually increasing the role of technology in schools. Next, the Commission turned its attention to articulating a vision of education in California in which improving student achievement is intertwined with the growing significance of integrating technology in the teaching and learning process, as well as the administration of schools.

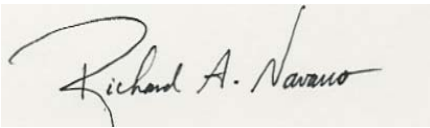
The proposed Master Plan was guided by five principles. First, that educational technology is both a **tool** for overcoming many of the barriers to learning, particularly among our most challenging educational conditions (i.e., poverty, limited English proficiency, before and after-school activities, literacy and numeracy, limited resources, etc.); AND, that educational technology is a **skill** required for full participation in the workforce and society.

Second, that technology provides an unprecedented opportunity to completely **redefine the learning environment** for all children and adults, inside of school and beyond. Third, that to realize its potential, the technology **must work** and **it has to be accessible anytime, anywhere, for all users**. Fourth, that achieving these goals is not just the responsibility of governments, but **the responsibility of all citizens**. The private sector has a particular interest in the success of this endeavor because our success (or failure) will determine the **productivity of our future workforce**. And society has an intrinsic interest in the changes proposed because the productivity of its citizens will have a direct effect on the **quality of life for future generations**.

And, fifth, that there is a general consensus that our children require **more powerful learning opportunities to achieve high standards of knowledge and skills**, to be prepared to assume the mantle of leadership in tomorrow’s fiercely competitive global society.

Therefore, we have proposed a Master Plan that will catalyze those actions, which we believe, will help to “tip” the educational system in the direction of harnessing the power we believe exists in technology for the benefit of all our children and society as a whole. Society is slow to catch up with the pace of technological innovation; it is our hope that this Master Plan will contribute to accelerating that process.

This Master Plan is the result of countless hours of deliberation, debate, and compromise among a very committed group of Commissioners, Department of Education staff, consultants, and many other professionals from both the public and private sectors who care deeply about children and are passionate about the promise of technology for lifting the ceiling on learning. Much of this deliberation occurred in less than ideal circumstances. But, as the State's economy worsened and the resources to support the Commission's work became scarcer, the determination of the Commissioners to complete the task without compromising in the quality or integrity of the plan was strengthened. Fortunately, we were blessed with an equally hard working staff in the California Department of Education, and an extremely talented team of consultants. While the ideas and recommendations are those of the Commissioners, the harmonic prose is the teamwork of Drs. Lara Brown and Christina Dehler. Personally, I have been honored to have had the privilege of working with such an excellent team. If we can claim any inspiration for this plan, it is our collective respect and admiration for the tens of thousands of educators who touch our future everyday. As Californians, we dedicate this Master Plan to the future--California's children.

A handwritten signature in black ink on a light-colored rectangular background. The signature is written in a cursive style and reads "Richard A. Navarro".

Richard A. Navarro, Ph.D.  
Chair

The Commission on Technology in Learning  
**Recommended Actions**

1. The State should study, identify and determine multiple measures for a Technology Integration Performance Index (TIPI) and develop appropriate methods for the collection, analysis, and publishing of the TIPI in the Annual School Accountability Report.
2. The State should use the TIPI to develop incentives and allocate resources to districts and schools to help them achieve ubiquitous access to rigorous and effective digital content to meet the diverse learning needs of all students.
3. The State should continue to support, expand, and coordinate technology resources such as, the Digital California Project (DCP) and California Learning Resources Network (CLRN), to gather and promote access to rigorous and effective digital content.
4. The State Board of Education should revise the K-8 Instructional Materials Adoption process to provide for a more in-depth review of each Electronic Learning Resources (ELR) submitted for adoption, including an assessment of the rigor and effectiveness of the resource. To help educators take advantage of appropriate technology, review results should identify the specific standard(s) addressed by each separate ELR, be posted on the CLRN website, and be searchable by the academic content standards addressed by each resource.
5. The State should provide incentives to business and industry to develop rigorous and effective digital content in curriculum, instruction, and assessment that are aligned to State Academic Content Standards and take advantage of appropriate technology.
6. The State should provide incentives to districts and schools to integrate rigorous and effective digital content in curriculum, instruction, and assessment that are aligned to State Academic Content Standards and take advantage of appropriate technology.
7. The State should develop information and technology literacy standards for all students at every grade level, and as an interim step, may consider the adoption of the International Society for Technology in Education (ISTE) National Education Technology Standards (NETS).
8. The State should provide incentives to establish and sustain high-quality partnerships and annually recognize exemplary partnerships that develop students' information and technology literacy.
9. The State should use the TIPI to develop incentives and allocate resources to districts and schools to help them achieve ubiquitous access to rigorous and effective systemic professional development that promotes the integration of technology in education.

10. The State should provide incentives to districts and schools to foster and sustain rigorous and effective systemic professional development that promotes the integration of technology in education.
11. The State should provide incentives to business and industry to foster and sustain rigorous and effective systemic professional development that promotes the integration of technology with their education products.
12. The State should use technology and statewide technology resources to foster and sustain rigorous and effective systemic professional development that promotes the integration of technology in education.
13. The State should provide incentives that fairly compensate educators who show leadership by developing technology innovations and transfer the intellectual property rights to the State, thereby, placing the innovations in the public domain.
14. The State should provide incentives to enhance K-12 collaboration with higher education, business and industry, nonprofits and community-based organizations to use technology across the professional development continuum (teacher education through accomplished teaching).
15. The State should provide incentives to districts and schools that encourage educators to use data to inform reflective practice and guide continuous improvement; and frequently publish those exemplary applications of data-driven decision-making.
16. The State should provide incentives to high-quality partnerships and annually recognize exemplary partnerships that deliver professional development focused on reflective practice and continuous improvement.
17. The State should use the TIPI to develop incentives and allocate resources to districts and schools to help them achieve ubiquitous access for all students and educators.
18. The State should explore providing learning opportunities that use technology to promote State Academic Content Standards and qualify for average daily attendance (ADA) funding, allowing for greater flexibility with categorical funding and resources.
19. The State should require districts and schools to incorporate the total cost of ownership model as a prerequisite to receiving new educational technology funding.
20. The State should be required to review and update the District Planning Guidelines as necessary.
21. The State should provide incentives to high-quality partnerships and annually recognize exemplary partnerships that foster innovation and sustain technology acquisition and integration.

22. The State should develop incentives that promote the coordination of existing education policy and resources for technology acquisition and integration.
23. The State should encourage local flexibility to allow categorical funds and Lottery funds to be used for technology acquisition and integration.
24. The State should provide support and assistance to districts and schools to help them collect and use data to make better-informed decisions.
25. The State should use technology to coordinate state efforts to collect, secure, analyze, plan, and annually publish data related to technology integration and its impact on district, school, and student improvement.

The following matrix illustrates how the 25 Recommended Actions in this document support a number of categories/themes associated with “closing the gaps.”

<b><u>Closing the Gaps Matrix</u></b>	<b><u>Curriculum, Instruction, &amp; Assessment</u></b>	<b><u>Professional Development</u></b>	<b><u>Infrastructure</u></b>
Ubiquitous Access	1, 2	1, 9	1, 17
Educational Technology	1, 3, 4, 5	1, 10, 11, 12, 13, 14, 15, 16	1, 18, 19, 20, 21, 22, 23, 24, 25
Technology Integration	1, 6, 7, 8	1, 10, 11, 12, 13, 14, 15, 16	1, 18, 19, 20, 21, 22, 23, 24, 25

Numbers in the table correspond to specific Recommended Actions (1 – 25).

## Vision for California: Closing the Gaps

*Closing the gaps in access to technology that enhance and enable teaching, learning and leadership, will help all students achieve mastery of the State Academic Content Standards throughout California, providing students a future of choices and a choice of futures.*

California's global economic future increasingly depends on California's educational system. California currently ranks as the world's fifth largest economy, yet despite significant interest and improvement in recent years, California's K-12 educational system still ranks below most other states on key educational benchmarks including, spending and student achievement.<sup>1</sup>

The Commission on Technology in Learning (CTL) recognizes the need for California's educational system to improve, and it is the hope of the CTL that the recommendations in this report will ensure that **technology** is systemically integrated into all levels of education. The CTL believes that California has the opportunity to reemerge as a national educational leader by investing in our schools and working with educators<sup>2</sup> to integrate the technologies that will enhance and enable teaching, learning, pedagogy, and school management.

Education continues to be an issue of concern and a high investment priority for Californians. The CTL believes that educational technology policy initiatives and funding at the state level should be aligned to recognize student achievement, educational leadership, and school improvement. Moreover, these initiatives and funding allocations should be designed to provide consistency, stability, and transparency to educators and the public. The policy environment at the state level must facilitate the ability of educators at both districts and schools to use technology to ensure that all students achieve mastery of the State Academic Content Standards at every grade level. The Commission recognizes that these educational goals cannot be achieved through state action and support alone. Thus, the CTL calls on those from higher education, business and industry, and nonprofit and community organizations to assist educators and policymakers to improve and further **technology integration** in California schools.<sup>3</sup>

The Commission on Technology in Learning believes that educational technology, equitably distributed and appropriately applied, enhances and enables student learning, innovative teaching, professional development, school management, **data-driven decision-making**, and collaboration across the education spectrum.

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<sup>1</sup> Howell, Penny and Miller, Barbara. 2001. "How California Ranks: A Comparison of Education Expenditures," *EdSource*, October issue, p. 1-8.

<sup>2</sup> Refers to all teachers, administrators, and school staff. This is in keeping with the organizational learning literature that discusses the importance of everyone involved in a system (Senge, 2000).

<sup>3</sup> Throughout the document, key terms will be highlighted and defined in Appendix I.

## **Nature and Purpose of the Education Technology Master Plan**

The purpose of the Education Technology Master Plan is to provide a vision for the state on how to effectively use and support educational technology to improve student achievement, close the gaps in access to educational technology, and move California schools to at least parity with or exceed the level of technology integration in other states.

The Education Technology Master Plan sets forth goals and recommendations for state policymakers to help educators attain higher levels of educational technology integration by the year 2008. Achieving higher levels of educational technology integration will close the gaps in access to improved curriculum, instruction, and assessment; professional development; and infrastructure statewide.

## **Progress Towards the 1996 Plan: Connect, Compute, and Compete**

Progress has been made towards the goals of the 1996 California Education Technology Master Plan (*Connect, Compute, and Compete*). The 1996 Plan was intended to assess the current state of technological readiness in California's classrooms and libraries and to serve as a blueprint for action. It recommended building the technology capacity in California's schools, so that by the year 2000, California would have met the following objectives:

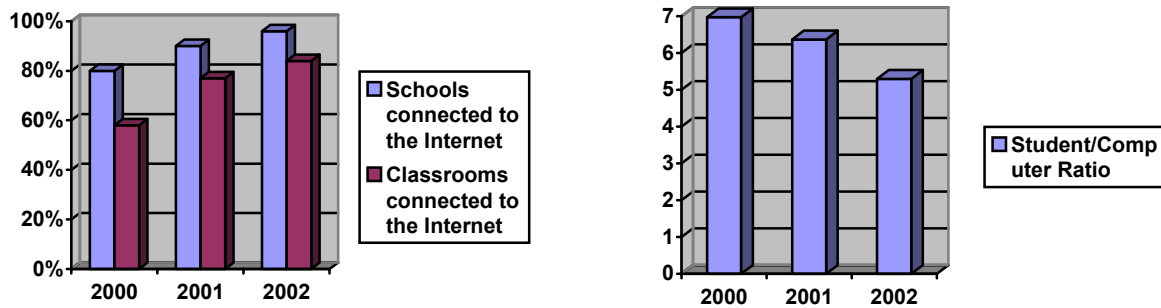
- A student-to-computer ratio of four to one;
- Telecommunications access for students in every classroom and library;
- Technology as an integral resource for all students and teachers; and
- Reading and math scores above the 50<sup>th</sup> percentile nationally.

Despite significant effort and commitment, at both the State and regional levels, the lack of overall educational technology funding, and the lack of priority educational technology has received relative to other educational needs among state policymakers have been the primary impediments to reaching the 1996 objectives. The current economic downturn continues to adversely affect the state's progress because of the high-cost nature of educational technology integration into curriculum and assessment, including the need for professional development and hardware acquisition. In addition, many schools in California have complex infrastructure needs, including those related to telecommunications and electrical requirements, which have also served as impediments to the successful implementation of the educational technology goals set forth in 1996.

While the educational technology goals set in 1996 have not yet been achieved, the gains have been impressive, especially with respect to the ratio of students to computers and Internet access in classrooms. The California Technology Assistance Project (CTAP) *Summary of Year 2002 School Technology Survey Findings: California Statewide Report*, found that 96% of schools were connected to the Internet in 2002, and that telecommunication access in the classroom has broadened across the state with the average school providing connections to the Internet in 84% of its classrooms (up from 58% two years earlier). Additionally, the student-to-computer ratio (a

common measurement of student access to computers) has made steady improvement, declining to a ratio of 5.3 to one in 2002. Another measurement of student access to technology is the ratio of students-to-multimedia computers (which include computers with internet access capability). During 2002, this ratio was 9.10 to one; however, because the definition for multimedia computers changed in 2002 for purposes of the survey, reliable trend data is not available.

### *Connectivity & Access*



With recent efforts at the state level to fund the implementation of comprehensive technology programs, such as the Digital High School Program, California schools have made significant gains in connectivity and access to technology. High schools reportedly provide students with access to more technology than at the other grade levels, with 99% of high schools in the state connected to the Internet, 94% of their classrooms connected, and a student to computer ratio of 4.1 to one. It is only through sustained, ongoing efforts such as the Digital High School Program that effective technology integration can take place.

Conversely, the survey findings provide a clearer picture of how well technology in our schools is supported at the district and site levels. Survey results indicate that although schools are acquiring more computers and high-speed connections to the Internet, there is a clear lack of personnel to provide technical support and training to help teachers integrate educational technology with instruction. In 2002, 62% of schools had no certificated personnel to provide technical support and 45% of schools had no classified personnel to provide technical support. Additionally, 33% of schools had to wait more than a week (but less than a month) for hardware repairs, making it more difficult to utilize technology on a regular basis for instruction. Support and training for the integration of computer technology into daily lesson planning has emerged as a critical area in recent years. In 2002, 50% of schools had no certificated staff at the school site to provide the necessary curriculum support.

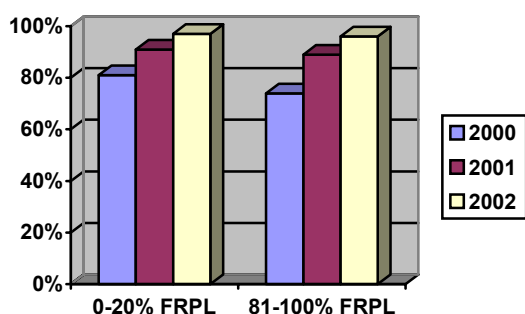
All students should have access to state of the art technology and rigorous and effective **digital content**. Although the “digital divide” gap is closing, California schools still struggle with digital inequities. Despite the state’s efforts, students living in poverty continue to have less access to better technology. Survey results indicate that students attending the “richest” schools in California (those with the lowest poverty levels) have a student-to-computer ratio of 4.74, as compared to a ratio of 6.13 for the poorest schools (those with the highest levels of poverty).



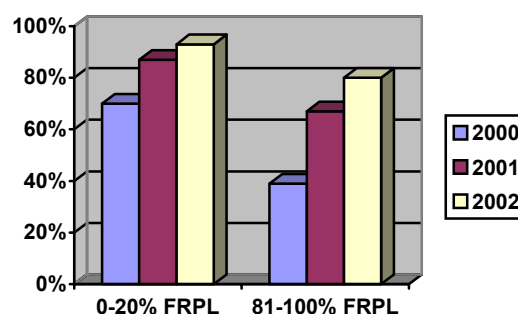
Also, schools with high poverty levels reported fewer classrooms connected to the Internet (80%) as compared to schools with low poverty levels (93%).

### **Connectivity & Access by Measures of Poverty – Free and Reduced Priced Lunch (FRPL)**

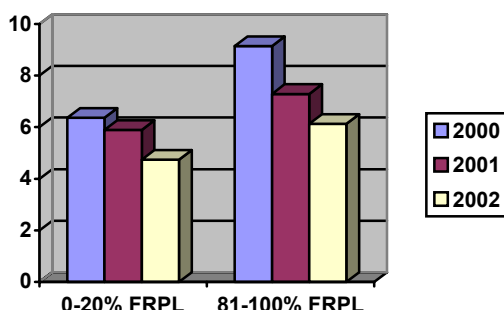
*Schools Connected to the Internet*



*Classrooms Connected to the Internet*



*Student to Computer Ratio*



Federal educational technology programs, such as the E-rate program and the Technology Literacy Challenge Grant Program, have made efforts to target high poverty schools and the data shows marked improvements in access and connectivity in even the poorest schools as compared to two years ago. In the last two years, the number of high poverty schools connected to the Internet increased from 74% to 96%, which almost equals the same percentage as for the “richest” schools (97% in 2002). Also, the number of classrooms connected to the Internet for the poorest schools, made significant gains, increasing from 39% to 80%.

As California plans for the future, policymakers must recognize the technology investment that the state has made in our schools and understand that the recommendations in this report aim to maximize that investment by putting the power of technology into the hands of all teachers, students, and administrators.

## Looking Forward

The Commission on Technology in Learning is committed to the integration of technology in education to enable and enhance the ability of educators at both the district and school site to improve student achievement.

Recognizing that technology will change over the next five years, the CTL encourages the state to support local flexibility in the integration of technology. It is important to allow educators flexibility to ensure that technology is used appropriately to meet the needs of all students. The CTL believes that the state must consistently support and align education policy to promote the integration of technology throughout California.

In recent years, California passed legislation that has furthered the integration of technology in education. Programs such as, Digital High Schools, have benefited students throughout California and should continue to be supported by policymakers. Current statewide technology resources such as the Digital California Project (DCP), California Student Information System (CSIS), California Learning Resource Network (CLRN), California Technology Assistance Project (CTAP), Technology Information Center for Administrative Leadership (TICAL), Technical Support for Education Technology in Schools (TechSETS), and the California Teacher Technology Assessment Project CTAP<sup>2 4</sup>, have also played a significant role in California's technology integration and need to continue to be supported and expanded to better serve the needs of the districts, schools, and educators throughout the state.

The Commission on Technology in Learning recommends that the state continue to develop the possibilities of the Digital California Project to ensure the availability of the network to all schools and to realize effective uses for the newly completed network (multi-dimensional aspect). The Commission also recommends that the state focuses on the coordination and efficient use of resources and explores the possibilities for furthering data-driven decision-making processes at all levels. Consistency and alignment of policy and funding at the state and local levels are critical for California to improve educational technology integration to assist all students in achieving California's State Academic Content Standards.

The Commission on Technology in Learning gathered<sup>5</sup> examples of promising practices to demonstrate the variety of ways technology is integrated in education to improve curriculum, instruction, assessment, professional development, and school management.

- ***Ubiquitous Access***

Closing the gaps in access to educational technology for students and educators will help all students achieve the State Academic Content Standards. Ubiquitous access will ensure that student and educator work is neither impeded, nor restricted to the school or district site. Districts and

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<sup>4</sup> These statewide technology resources are defined in Appendix VII.

<sup>5</sup> The California Department of Education's Technology Office distributed a "Call for Case Studies" to the CTAP Regional Directors as a source of promising practices and solicited information from projects discussed during the Commission Meetings.

schools have approached providing ubiquitous access differently in their local communities. For examples of “Promising Practices” to meet the challenges of ubiquitous access to technology, visit the CDE website at [www.cde.ca.gov/edtech](http://www.cde.ca.gov/edtech).

- ***Curriculum, Instruction, and Assessment***

Closing the gaps in access to rigorous and effective digital content will help all students and educators to be both users and producers of academic content and innovative curriculum and assessment, furthering efforts to ensure that all students achieve State Academic Content Standards. Districts and schools have created and utilized an assortment of rigorous and effective digital content ranging from commercial software to educator developed materials. For examples of “Promising Practices” to meet the challenges of access to digital content, visit the CDE website at [www.cde.ca.gov/edtech](http://www.cde.ca.gov/edtech).

- ***Professional Development***

Closing the gaps in access to systemic professional development will ensure the integration of educational technology into curriculum, pedagogy, and school management. Districts and schools have developed different programs for delivering technology training. For examples of “Promising Practices” to meet the challenges of access to professional development, visit the CDE website at [www.cde.ca.gov/edtech](http://www.cde.ca.gov/edtech).

- ***School Management***

Closing the gaps in access to professional development focused on school management and educational technology integration; to district, school, and student data; and to the educational technology that facilitates procedures and processes, and provides analytical feedback will ensure effective and efficient school management. Districts and schools have addressed improving school management differently. Districts and schools have developed different programs for delivering technology training. For examples of “Promising Practices” to meet the challenges of access to school management, visit the CDE website at [www.cde.ca.gov/edtech](http://www.cde.ca.gov/edtech).

- ***Assistive Technology***

Closing the gaps in access to assistive technology will ensure that all students, including English language learners, and those with disabilities and special needs achieve State Academic Content Standards. Assistive technology allows educators to develop individualized learning programs to meet the needs of all students. Different technologies exist to help all students meet their learning needs. For examples of “Promising Practices” to meet the needs for assistive technology, visit the CDE website at [www.cde.ca.gov/edtech](http://www.cde.ca.gov/edtech).

- ***Higher Education, Business, and Community Partnerships***  
**High-quality partnerships** will help districts and schools close the gaps in curriculum, professional development, and infrastructure. Partnerships with higher education institutions, businesses, and community organizations provide districts and schools opportunities to leverage resources and expertise to promote the integration of technology in education. Districts and schools have developed various types of partnerships. For examples of “Promising Practices” related to successful partnerships, visit the CDE website at [www.cde.ca.gov/edtech](http://www.cde.ca.gov/edtech).

## **Goals and Recommendations**

### ***Vision for California: Closing the Gaps***

*Closing the gaps in access to technology that enhance and enable teaching, learning and leadership, will help all students achieve mastery of the State Academic Content Standards throughout California, providing students a future of choices and a choice of futures.*

#### **Recommended Action:**

1. The State should study, identify and determine multiple measures for a **Technology Integration Performance Index (TIPI)** and develop appropriate methods for the collection, analysis, and publishing of the TIPI in the Annual School Accountability Report.

### ***Curriculum, Instruction, and Assessment: Ubiquitous Technology and Mastery of Academic Standards***

*Closing the gaps in access to rigorous and effective digital content aligned to the State Academic Content Standards and fully integrated into curriculum, instruction, and assessment will help ensure that all students are prepared to meet the present and future needs of California.*

- **Equity and Access**

Goal: All students and educators will have **ubiquitous access** and the ability to utilize rigorous and effective digital content.

Rationale: Technology may be used effectively to facilitate the distribution and broaden the delivery of rigorous and effective digital content throughout California. The digital divide that stretches across many communities is not only related to hardware and connectivity, but also to rigorous and effective digital content. Traditionally, students in the least advantaged schools also have had the least access to rigorous and effective

digital content.<sup>6</sup> Closing this knowledge gap requires the state to ensure that rigorous and effective digital content is accessible and utilized by all students and teachers to assist students in meeting and exceeding the State Academic Content Standards. Importantly, technology allows all students, including English language learners and those with special needs, the opportunity to participate fully in education. Ensuring equity and access to rigorous and effective digital content allows students and teachers to be both users and producers of academic content and innovative curriculum and assessment, furthering efforts to improve student achievement.

Recommended Actions:

2. The State should use the TIPI to develop incentives and allocate resources to districts and schools to help them achieve ubiquitous access to rigorous and effective digital content to meet the diverse learning needs of all students.
3. The State should continue to support, expand, and coordinate technology resources such as, the DCP and CLRN, to gather and promote access to rigorous and effective digital content.

Target Tech Indicators:

- 100% of students and educators have ubiquitous access to rigorous and effective digital content to meet the diverse learning needs of all students.
- Digital content is seamlessly integrated and used by 100% of students and educators on a daily basis in all classes and subjects.
- 100% of students have anytime, anywhere access to online course units to supplement and expand course offerings.

• **Standards**

Goal: All educators will fully integrate into their practice appropriate educational technology and rigorous and effective digital content to promote mastery of the State Academic Content Standards by all students.

Rationale: Educational technology and digital content, aligned to State Academic Content Standards, enable students and teachers to address individual learning needs (e.g., age, disabilities, ability level, special needs) using multiple approaches to rigorous and effective content. Learning flexibility increases the opportunities for all students to achieve mastery of the State Academic Content Standards. Educational technology promotes this flexibility, along with collaboration, innovation, applied and contextual learning, and has been shown to increase student achievement.<sup>7</sup> Moreover, educational technology makes possible data collection, analysis and real-time assessment of learning,

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<sup>6</sup> *Summary of Statewide Results for the 2001 California Technology; Summary of Statewide Results for the 2002 California School Technology Survey*; Macias, Julia; Montes, Ana; and Cibrán, Alma. 2001. "Connecting California's Children: Is E-Rate Enough?" in *Latino Issues Forum*, July issue, p.1-28.

<sup>7</sup> Ringstaff, Cathy. *Survey of Existing Evaluations on the Impact of Education Technology on Teaching and Learning*. WestEd.; Branigan, Cara. 2002. "Missouri's Ed-Tech Program Is Raising Student Achievement," in *eSchool News*, March 13.

all of which provide educators with necessary feedback loops that assist in identifying and targeting the individual learning needs of students.

Recommended Action:

4. The State Board of Education should revise the K-8 Instructional Materials Adoption process to provide for a more in-depth review of each Electronic Learning Resources (ELR) submitted for adoption, including an assessment of the rigor and effectiveness of the resource. To help educators take advantage of appropriate technology, review results should identify the specific standard(s) addressed by each separate ELR, be posted on the CLRN website, and be searchable by the academic content standards addressed by each resource
5. The State should provide incentives to business and industry to develop rigorous and effective digital content in curriculum, instruction, and assessment that are aligned to State Academic Content Standards and take advantage of appropriate technology.
6. The State should provide incentives to districts and schools to integrate rigorous and effective digital content in curriculum, instruction, and assessment that are aligned to State Academic Content Standards and take advantage of appropriate technology.

Target Tech Indicators:

- 100% of curriculum and assessment incorporate rigorous and effective digital content that is aligned to state academic standards and takes advantage of appropriate technology.
- 100% of students and educators utilize curriculum and assessment that incorporate rigorous and effective digital content that is aligned to state academic standards and takes advantage of appropriate technology.
- 100% of educators utilize CLRN to assist in developing lesson plans that incorporate rigorous and effective digital content, integrate state academic standards, and take advantage of appropriate technology.

• **Information & Technology Literacy**

Goal: All students will develop information and technology literacy skills<sup>8</sup> that enable them to meet and exceed the demands for an information and technologically literate workforce.

Rationale: The knowledge economy age requires that workers be information-literate, “a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information.”<sup>9</sup> Workers must also have knowledge of and proficiency with numerous technologies (e.g., hardware, programs,

<sup>8</sup> International Society for Technology in Education includes a set of skills as a part of their NETS and the website address is included in Appendix VI: ISTE NETS.

<sup>9</sup> *American Library Association Presidential Committee on Information Literacy*. Chicago: American Library Association, 1989.

applications) and the vast resources available through the Internet and the World Wide Web. Students who are the workers of tomorrow must learn to develop the skills that will enable them to use the technological tools available and to understand the information gleaned and analyzed by the technology. Ensuring students develop **information and technology literacy** will help to ensure the state's economic competitiveness in the 21<sup>st</sup> Century.

Recommended Action:

7. The State should develop information and technology literacy standards for all students at every grade level, and as an interim step, may consider the adoption of ISTE National Education Technology Standards (NETS).
8. The State should provide incentives to establish and sustain high-quality partnerships and annually recognize exemplary partnerships that develop students' information and technology literacy.

Target Tech Indicators:

- 100% of information literacy skills are embedded in and assessed by the State Academic Content Standards<sup>10</sup>
- 100% of high-quality partnerships develop student mastery of information and technology literacy skills.

***Professional Development: Systemic Reforms and Continuous Improvement***

*Closing the gaps in access to systemic professional development that encourages leadership, collaboration, and continuous improvement will ensure ubiquitous technology integration in education that supports the present and future needs of California.*

- **Equity and Access**

Goal: All educators will have access to rigorous and effective systemic professional development that promotes the integration of technology in education.

Rationale: Technologies may be used effectively to facilitate the distribution and broaden the delivery of rigorous and effective professional development across the state. The opportunity to develop professionally must be equally accessible to all educators. Improving upon and learning new methods for technology integration will bring about systemic reform in curriculum, assessment, pedagogy, and school management.

Recommended Actions:

9. The State should use the TIPI to develop incentives and allocate resources to districts and schools to help them achieve ubiquitous access to rigorous and effective systemic professional development that promotes the integration of technology in education.

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<sup>10</sup> See Appendix V.

Target Tech Indicators:

- 100% of educators have ubiquitous access to rigorous and effective systemic professional development that promotes the integration of technology in education.
- 100% of educators' release time is compensated for rigorous and effective systemic professional development that promotes the integration of technology in education.

## • **Systemic Professional Development**

Goal: All educators will receive the training, resources and support necessary to appropriately and effectively integrate technology into curriculum, assessment, pedagogy, and school management.

Rationale: Capacity building in the profession and reform in education requires that all educators participate in **systemic professional development** programs that support the integration of technology. Educators' varying technology proficiencies require a professional development model that evolves as technical skills increase. This professional development model should be systemic, comprehensive, and include fully supported training that is scaffolded according to individual needs, providing opportunities for one-on-one interaction, workplace and classroom support, and on-line instruction. This model should also include daily or weekly training to meet technical and pedagogical needs, as well as annual or semi-annual intensive training to learn new applications and pedagogical strategies. Most important, educators need time to participate in training programs, develop their newly learned skills, and apply them into their practice. Systemic professional development for technology integration must be fully supported at the state, district, and school level.

Recommended Action:

10. The State should provide incentives to districts and schools to foster and sustain rigorous and effective systemic professional development that promotes the integration of technology in education.
11. The State should provide incentives to business and industry to foster and sustain rigorous and effective systemic professional development that promotes the integration of technology with their education products.
12. The State should use technology and statewide technology resources to foster and sustain rigorous and effective systemic professional development that promotes the integration of technology in education.

Target Tech Indicators:

- 100% of professional development is systemic and promotes the integration of technology in education, and uses technology to deliver rigorous and effective training, mentoring, and support to educators statewide.



- 100% of educators use and integrate rigorous and effective digital content into their practice.

- **Leadership and Collaboration**

Goal: All educators will engage in **professional activities** that develop rigorous and effective digital content, integrate technology in education, and promote leadership and collaboration across the education profession.

Rationale: Educators need to be actively working together to create, share, and scale best practices, rigorous and effective digital content and effective uses of technology integration. Technology provides educators the opportunity to work collaboratively, independent of location, to develop and disseminate exemplars of technology integration into curriculum, instruction, assessment, pedagogy, and school management. Educators need to develop leadership skills that encourage the systemic production, evaluation, and application of digital content, and support the use of technology in schools. Educators also need to serve as models and mentors, to sustain a positive professional culture of continuous improvement and a system of opportunity for professional development that makes use of all available resources at the local, state, and national level.

Recommended Action:

13. The State should provide incentives that fairly compensate educators who show leadership by developing technology innovations and transfer the intellectual property rights to the State, thereby, placing the innovations in the public domain.
14. The State should provide incentives to enhance K-12 collaboration with higher education, business and industry, nonprofits and community-based organizations to use technology across the professional development continuum (teacher education through accomplished teaching).

Target Tech Indicators:

- 100% of districts and schools offer systemic professional development, perhaps in partnerships, which cultivate leadership skills and encourage experimentation with the effective uses of technology.
- 100% of districts and schools provide opportunities for educators to engage in collaborative activities focused on technology integration.

- **Continuous Improvement**

Goal: All educators will participate in systemic professional development activities that encourage reflective practices and use technology to continuously improve curriculum, assessment, pedagogy, and school management.

Rationale: Systemic professional development must encourage reflective practice, data-driven decision-making processes, and continuous improvement in education. Educators

need to be actively working to continually improve their use of technology in order to improve teaching, learning and school management. Reflective practice requires that educators be knowledgeable of current research and application, develop mechanisms that provide feedback, and work to continually improve their skills. Educators must also use data to make better-informed decisions about the appropriate and effective uses of technology.

**Recommended Action:**

15. The State should provide incentives to districts and schools that encourage educators to use data to inform reflective practice and guide continuous improvement; and frequently publish those exemplary applications of data-driven decision-making.
16. The State should provide incentives to high-quality partnerships and annually recognize exemplary partnerships that deliver professional development focused on reflective practice and continuous improvement.

**Target Tech Indicators:**

- 100% of districts and schools offer systemic professional development that teaches data-driven decision-making skills and encourages the use of technology for continuous improvement.
- 100% of districts and schools make use of state of the art technology to continuously improve curriculum, assessment, pedagogy, and school management.

***Infrastructure: Ubiquity, Sustainability, and Dynamic Design***

*Closing the gaps in anytime, anywhere access for all students and educators; promoting sustainability and comprehensive planning; and leveraging resources and education data will ensure a dynamic technological infrastructure that supports the present and future needs of California.*

**• Equity and Access**

Goal: All students and educators must be able to access and utilize all necessary and appropriate technology resources anytime, anywhere.<sup>11</sup>

Rationale: Large inequities exist and persist in anytime, anywhere access to operable, reliable, and assistive technology for all students and educators across all communities in California. There are significant technological infrastructure challenges statewide, some impacting rural and urban districts, others affecting schools and their communities.

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<sup>11</sup> For a further definition of anytime, anywhere access, refer to the Target Tech Level provided in the CEO Forum StaR Charts in Appendix II.

Moreover, ubiquitous access to and reliable operability of assistive technology ensure that the learning needs of all students are met in an appropriate and timely manner.

Recommended Action:

17. The State should use the TIPI to develop incentives and allocate resources to districts and schools to help them achieve ubiquitous access for all students and educators.
18. The State should explore providing learning opportunities that use technology to promote State Academic Content Standards and qualify for average daily attendance (ADA) funding, allowing for greater flexibility with categorical funding and resources.

Target Tech Indicators:

- 100% of students and educators have ubiquitous access and can utilize all necessary and appropriate technology.
- 100% of districts and schools have greater flexibility with categorical funds and the allocation of resources to promote learning opportunities using technology.

• **Sustainability and Comprehensive Planning**

Goal: All districts and schools must engage in comprehensive technology planning, incorporating **total cost of ownership** into annual budget processes, and design infrastructure for sustainability and optimal utilization of present and future technology.

Rationale: Designing infrastructure for sustainability and optimal utilization means that technology cannot be treated as a stand-alone or a one-time cost in state, district, and school budgets. Sustainability requires that the technology infrastructure be scalable, reliable, upgradeable, and interoperable across the entire education system in California. As with other infrastructure costs, technology has several components, including technical support, maintenance, replacement, recycling, and disposal. Building infrastructure and acquiring technology requires state and local policymakers, educators, and education partners (businesses and nonprofit organizations) to employ a total cost of ownership model in their technology planning and budgeting. The State should encourage districts and schools to seek out new and leverage existing resources to design for sustainability and optimal utilization of technology.

Recommended Actions:

19. The State should require districts and schools to incorporate the total cost of ownership model as a prerequisite to receiving new educational technology funding.
20. The State should be required to review and update the District Planning Guidelines as necessary.
21. The State should provide incentives to high-quality partnerships and annually recognize exemplary partnerships that foster innovation and sustain technology acquisition and integration.

Target Tech Indicators:

- 100% of districts and schools incorporate the total cost of ownership model in their budgeting and planning for technology.
- 100% of districts and schools have technical support available twenty-four hours a day and seven days a week.

- **Leveraging Existing Resources**

Goal: All policymakers and educators must collaborate to promote flexibility with existing state technology tools, funding mechanisms, and additional resources to coordinate and develop a sustainable, ubiquitous, and dynamic technology infrastructure.

Rationale: At all levels policymakers and educators need greater flexibility to leverage and coordinate existing resources to ensure a sustainable, ubiquitous, and dynamic infrastructure (e.g., how funds and building spaces are used and allocated for technology integration). With increased flexibility, there is a need to design policy that improves accountability in the area of technology integration emphasizing outcomes and not inputs (e.g., student achievement and administrative efficiency, and not categorical funding). Moreover, the state has invested significantly in the use of technology by creating resources such as a statewide network, a technical assistance support structure, a curriculum tool, professional development and resources for administrators and technology staff, and a student data and record-keeping system. These technology tools provide tremendous benefit to educators and can be further developed and better coordinated to realize their potential. The State must continue its support of these programs and work to structure policy incentives to encourage local policymakers and educators to collaborate and leverage these and other resources.

Recommended Action:

22. The State should develop incentives that promote the coordination of existing education policy and resources for technology acquisition and integration.
23. The State should encourage local flexibility to allow categorical funding and Lottery Funds to be used for technology acquisition and integration.

Target Tech Indicators:

- 100% of districts and schools utilize state resources and work to coordinate local technology decisions with regional and statewide education opportunities for technology acquisition and integration.
- 100% of districts and schools have flexibility to leverage their resources and reallocate funding for technology acquisition and integration.

- **Collecting, Storing, Using, and Securing Data**

Goal: All policymakers, educators, students, and parents will have anytime, anywhere access to appropriate and necessary data that is securely collected and stored to help them make better-informed decisions related to educational technology integration.

Rationale: Technology may be used effectively to facilitate the collection and distribution of educational data and broaden the understanding of policymakers, educators, students, and parents to help them make better-informed decisions. There is a need for better student data at all levels, so that policymakers, educators, students, and parents will be able to assess and determine the educational effectiveness of their actions and decisions. While there are security and privacy issues related to record keeping, there are also sufficient technological safeguards that can secure student data. The State must support the secure coordination, collection, analysis, planning, and publishing of district, school, and student data in order to accurately assess educational improvement.

Recommended Actions:

24. The State should provide support and assistance to districts and schools to help them collect and use data to make better-informed decisions.
25. The State should use technology to coordinate state efforts to collect, secure, analyze, plan, and annually publish data related to technology integration and its impact on district, school, and student improvement.

Target Tech Indicators:

- 100% of districts and schools collect and use data relevant to technology integration and its impact on curriculum, assessment, pedagogy, and school management to make better-informed decisions.
- All education stakeholders have the necessary and appropriate data available to them through the State to help them better understand the educational effects of technology on curriculum, assessment, pedagogy, and school management.

## Appendix I: Definitions of terms used in plan

*Data-driven decision-making:* A process where educators use a variety of district, school, educator, student, and community data to make better-informed decisions about how to improve technology use, acquisition, and integration in education.

*Digital content:* The digitized multimedia material that calls upon students to seek and manipulate information in the collaborative, creative and engaging ways, which make digital learning possible. It includes video on demand, software, CD-ROMs, websites, e-mail, online learning management systems, computer simulations, streamed discussions, data files, databases, audio, and all other digital applications and devices.

*Educational technology:* The methods and materials employed to assist teaching, learning, and school management, and includes hardware, software, programs, applications, and all digital content.

*High-quality partnerships:* Collaborative agreements that are beneficial to all parties and occur between districts and schools with institutions of higher education, businesses, and nonprofits and community-based organizations, which address various educational needs.

*Information literacy:* The ability to locate, access, evaluate and effectively use information as needed from a variety of sources.

*Professional activities:* Includes all activities relating to training, mentoring, conference presentations, research, publishing, materials development and evaluation, and participation in and contributions to projects such as the Digital California Project (DCP), the California Learning Resource Network (CLRN) and other online resources.

*Rigorous and effective:* (insert definition)

*Systemic professional development:* A model for professional development that includes continuous and comprehensive anytime, anywhere training that evolves with, and accommodates all educators' needs and educational environments.

*Target Tech:* Is the desired level for every district and school to achieve and is further articulated in Appendix IV: CEO Forum School Technology and Readiness (STaR) Chart. Elements in the chart are used throughout the plan as suggested measures of progress.

*Technology integration:* Technology is seamlessly integrated into school culture, management, pedagogy, curriculum, instruction, and assessment. Effective and appropriate integration of technology is part of a planned program of school improvement as it relates to school management and student achievement of the State Academic Content Standards.

*Technology Integration Performance Index (TIPI):* An index of multiple measures that describes the learning environment for students and educators, and represents an objective

standard of the level of technology integration that all districts and schools should achieve.  
(See Appendix II.)

*Technology literacy:* The ability to use technology to improve student achievement, and the capability to think critically about the use and integration of technology in teaching and learning. ISTE NETS standards describe the technology skills and knowledge students should acquire as they progress through the K-12 system and is further articulated in Appendix VI: ISTE NETS.

*Total Cost of Ownership:* A model that incorporates all aspects of technology costs and includes, technical support, professional development, maintenance, replacement, recycling, and disposal.

*Ubiquitous access:* Is the availability of all resources necessary to utilize technology for teaching, learning, and school management, anytime, anywhere. It includes access to hardware, software, online resources, digital content, curriculum, assessment, and technical support. Ubiquitous access will ensure that student and educator work is neither impeded, nor restricted to the school or district site.

## Appendix II: Technology Integration Performance Index (TIPI)

The Technology Integration Performance Index (TIPI) of multiple measures, describing a learning environment for students and educators, should represent an objective standard on the level of technology integration that all districts and schools should achieve. The TIPI should be collected and published in the Annual School Accountability Report and should be considered a parallel index to the API.

The TIPI will measure the Target Tech levels of every district and school and will assist in mapping the progress of educational technology integration throughout California. Policymakers and educators will be able to use the TIPI to make better-informed decisions regarding the allocation of resources and the primacy of legislation needed to improve educational technology integration. The TIPI will assist parents, community members and other education partners to develop high quality partnerships that address local educational technology needs and priorities.

The Commission on Technology and Learning (CTL) recommends that the State study, identify and determine the multiple measures and their relative value for inclusion in the TIPI. While the Commission has not focused on the TIPI in depth, there has been consensus that the Index should measure the levels of ubiquitous access, educational technology, and technology integration, along the dimensions of curriculum, instruction, and assessment; professional development; and infrastructure at every school and district site throughout California. In other words, the TIPI should capture the breadth and the depth of the *Closing the Gaps Matrix* in the Executive Summary (see page --).

The Commission recommends that the State utilize those data elements already collected by state agencies, districts, and schools, and determine their relative value for inclusion in the TIPI. Additionally, the Technology in Schools Task Force developed a guide to assist those assessing technology in education through the National Cooperative Education Statistics System and funded by the National Center for Education Statistics (NCES) of the U.S. Department of Education. The Commission strongly recommends that the State review the findings of the Technology in Schools Task Force to develop the TIPI, including their report, *Technology in Schools: Suggestions, Tools, and Guidelines for Assessing Technology in Elementary and Secondary Education*, and the list of comprehensive data elements, reproduced in Appendix III of this plan.



**Appendix III: National Center for Education Statistics Technology in Schools:  
Suggestions, Tools, and Guidelines for Assessing Technology in Elementary  
and Secondary Education**

Appendix A2 from the above document published by the National Center for Education Statistics (NCES) contains a list of data elements to be reviewed for possible inclusion during the compilation of the TIPI. Refer to the website at <http://nces.ed.gov/pubs2003/2003313.pdf>.

**Appendix IV: CEO Forum K-12 School Technology and Readiness (STaR) and Teacher Preparation StaR Charts**  
<http://www.ceoforum.org/starchart.cfm>

# School Technology and Readiness (STaR) Achievement in the 21st Century

## How to find your school's profile

The CEO Forum's STaR Chart is a guide, not a definitive measure, of a school's effectiveness in integrating technology into the teaching and learning process.

Your school may fall within one category based on certain indicators and in another based on others. Such mixed readings are expected because every school is unique. The STaR Chart allows any school, district, or state, no matter what its budget, priorities, or current educational technology profile, to better understand where it is today and to better plan for its future goals.

**1** Select one of the five categories located across the top: Educational Benefits, Hardware & Connectivity, Professional Development, Digital Content or Student Achievement and Assessment.

**2** Under the selected category, find the box that best describes your school's efforts (it's possible that your school may fall between two boxes).

**3** After finding where your school falls, compare your school's program components with the ones listed in the Target Tech box, which describes the ideal scenario.

**4** Use your findings to start discussions with staff, administrators, technology directors, school board members, and community leaders about improving your school's education technology plan.

Star Indicators	Educational Benefits	Hardware & Connectivity				
	1	2	3	4	5	6
		Students per instructional computer connected to the Internet	Technical support	% of instructional rooms and administrative offices connected to the Internet	Quality of school's connection to the Internet	Use and availability of other forms of hardware technology
Early Tech	Master basic academic skills through linear drill and tutorial software	More than 10	Takes several days	More than 25%	Dial up access on some computers	VCRs, cable TV, projection devices, calculators
Developing Tech	<ul style="list-style-type: none"> <li>• Improve 21st century higher-order critical thinking with access to multimedia content</li> <li>• Greater resources available for research and learning from Internet and CD-ROM</li> </ul>	10 or less	Takes place next day	50% or more	Direct connectivity on campus and in some classrooms	VCRs, cable TV, telephones, voicemail, projection devices, digital cameras, calculators
Advanced Tech	<ul style="list-style-type: none"> <li>• Improve 21st century skills especially higher-order thinking, research, collaborative and creative skills</li> <li>• Most students/teachers able to communicate with parents, experts, other students and teachers outside school</li> </ul>	5 or less	Takes place same day	75% or more	<ul style="list-style-type: none"> <li>• Direct connectivity in most classrooms</li> <li>• Adequate bandwidth</li> </ul>	Wide variety of VCRs, cable TV, telephones, voicemail, random access video, projection devices, digital cameras, scanners, portals, personal digital assistants, two way video conferencing, calculators
Target Tech	<ul style="list-style-type: none"> <li>• Improve student achievement</li> <li>• Develop and support the full range of 21<sup>st</sup> century skills that students will need to thrive in today's educational environment and tomorrow's workplace</li> <li>• Promote student-centered authentic project-based learning</li> <li>• All students/teachers able to communicate with parents, experts, community members and teachers outside the school</li> <li>• Learning at home and at school occurs seamlessly</li> </ul>	1 student per instructional computer connected to the Internet	Tech support available 24/7	100% or more of all instructional rooms and administrative offices are connected to the Internet	Direct connectivity in all classrooms with adequate bandwidth to prevent delays	There is broad use of a wide variety of other technologies such as VCRs, cable TV, telephones, voicemail, random access video, personal digital assistants, two way video conferencing, projection devices, digital cameras, scanners, portals, calculators, thin clients, servers, etc.

Star Indicators	Professional Development			Digital Content				
	7	8	9	10	11	12	13	14
	Delivery and format of professional development	% of technology budget allocated to professional development	Understanding and use of digital content by educators	Format	Educator  Role of educator and degree to which digital content is integrated into instruction	Students  Students employ digital content to enhance learning	% of students using digital content and frequency of use	Content budget allocation to purchase digital content
Early Tech	Trainer-led instruction	Less than 10%	<ul style="list-style-type: none"> <li>• 100% at entry or adoption phase</li> <li>• A few use for lesson planning</li> </ul>	Receive information/ tools from prepackaged software	<ul style="list-style-type: none"> <li>• Teacher centered</li> <li>• Supplement instruction with digital content</li> </ul>	Reinforce basic academic skills	<ul style="list-style-type: none"> <li>• 50% or more</li> <li>• Weekly</li> </ul>	Use some Supplemental instructional materials funds only
Developing Tech	<ul style="list-style-type: none"> <li>• Trainer-led instruction</li> <li>• Embedded help within applications</li> </ul>	11-15%	<ul style="list-style-type: none"> <li>• 100% at adaptation phases</li> <li>• Some begin to use with students</li> </ul>	Receive information from CD-ROM and searchable, online content	<ul style="list-style-type: none"> <li>• Teacher directed</li> <li>• Beginning to integrate into instruction</li> </ul>	Use for research, communication s And presentations	<ul style="list-style-type: none"> <li>• 75% or more</li> <li>• 3-4 times a week</li> <li>• 20% have online course units available to expand opportunities</li> </ul>	Use significant instructional materials budget, but little to no textbook budget
Advanced Tech	Online mentoring	16-29%	100% at appropriation phases	Manipulatable digital content and tools available commercially and on the Web	<ul style="list-style-type: none"> <li>• Teacher facilitated in local or distant classrooms</li> <li>• Fully integrate into instruction and use for research, planning, multimedia presentations and simulations, and to correspond and communicate</li> </ul>	Use for research, to solve problems, to analyze data, to collaborate and to correspond with experts and to become content producers	<ul style="list-style-type: none"> <li>• 100%</li> <li>• Use digital content daily, but activities are isolated by grade, disciplines, classes</li> <li>• 30% or more have online course units available to expand opportunities</li> </ul>	Scrutinize entire budget as appropriate and shift funds from textbook budget to acquire digital content
Target Tech	Anytime, anywhere	30%	100% at appropriation or invention phases	Full range of digital content and tools structured to support production and collaboration	<ul style="list-style-type: none"> <li>• Student-centered in local or distant classrooms; teacher as guide</li> <li>• Digital content changes the teaching process, allowing for greater levels of inquiry, analysis, creativity and content production</li> </ul>	Digital content changes the learning process, allowing for greater levels of collaboration, inquiry, analysis, and creativity	<ul style="list-style-type: none"> <li>• Seamlessly integrated throughout all classes and subjects on a daily basis</li> <li>• 100% have online course units available to supplement and expand school course offerings</li> </ul>	100% instructional materials budget is available to purchase "most appropriate" content

Star Indicators	Student Achievement and Assessment						
	15	16	17	18	19	20	21
	Student achievement & 21 <sup>st</sup> century skills	Alignment and Continuous improvement	Assessment	Equity of access	Using research	Administrators	Parent & community involvement
Early Tech	Demonstrate improved basic skills	25% align standards, curriculum and assessment using technology	<ul style="list-style-type: none"> <li>• 25% or more beginning to integrate digital strategies into assessment</li> <li>• Limited to use of fixed answer format</li> </ul>	<ul style="list-style-type: none"> <li>• Some students have access to technology to reinforce basic skills</li> </ul>	Schools inconsistently apply ad hoc research	<ul style="list-style-type: none"> <li>• Communicate objectives w/ other administrators and teachers</li> </ul>	<ul style="list-style-type: none"> <li>• One-way access to school web page which communicates policies, standards and initiatives</li> </ul>
Developing Tech	Demonstrate some improved mastery of 21 <sup>st</sup> century skills	<ul style="list-style-type: none"> <li>• 50% align standards, curriculum and assessment and report results</li> <li>• 25% monitor and measure results to inform new instructional decisions</li> </ul>	<ul style="list-style-type: none"> <li>• 50% or more integrate digital strategies into assessment</li> <li>• Measure 25% of 21<sup>st</sup> century skills</li> <li>• Experiment with additional formats including open ended and self-assessment tools</li> </ul>	<ul style="list-style-type: none"> <li>• Can access Internet at times other than school hours</li> <li>• All teachers are appropriately trained to integrate technology</li> </ul>	<ul style="list-style-type: none"> <li>• 50% review external research and apply appropriately</li> <li>• 50% conduct internal research on program effectiveness</li> <li>• 50% of schools use IT for planning</li> <li>• 25% of teachers use IT in classrooms for ad hoc action</li> </ul>	<ul style="list-style-type: none"> <li>• Use technology to collect data and communicate with constituents</li> <li>• Initiate some data driven decision making</li> </ul>	<ul style="list-style-type: none"> <li>• Limited access to two-way communications via email, and privacy-protected web tools, e.g., to obtain individual attendance &amp; assessment data</li> </ul>
Advanced Tech	Demonstrate mastery of 21 <sup>st</sup> century skills	<ul style="list-style-type: none"> <li>• 100% align standards, curriculum and assessment using technology and report results</li> <li>• 50% monitor and measure results to inform new instructional decisions</li> </ul>	<ul style="list-style-type: none"> <li>• 75% or more integrate digital strategies into assessment</li> <li>• Measure 50% of 21<sup>st</sup> century skills</li> <li>• Use multiple formats including project based assessment, portfolios and simulations</li> </ul>	<ul style="list-style-type: none"> <li>• Can access digital content at times other than school hours</li> <li>• 75% or more of students use technology to develop 21<sup>st</sup> century skills</li> </ul>	<ul style="list-style-type: none"> <li>• 100% use external research and apply appropriately</li> <li>• 100% conduct internal research on program effectiveness</li> <li>• 100% use IT in classrooms and administrative planning to collect and manage data to improve current operations</li> </ul>	<ul style="list-style-type: none"> <li>• Use technology to collect data and analyze results</li> <li>• Use technology for data driven decision making</li> </ul>	<ul style="list-style-type: none"> <li>• Communicate two-way via email, and privacy protected web tools, e.g., to access some school information and resources from home</li> </ul>
Target Tech	Demonstrate improved student achievement and mastery of the full range of 21 <sup>st</sup> century skills	100% align standards, curriculum and assessment using technology 100% monitor and measure results to support teaching and learning and link to continuous improvement	<ul style="list-style-type: none"> <li>• 100% integrate digital strategies in assessment</li> <li>• Measure 100% of the entire range of 21<sup>st</sup> century skills</li> <li>• Technology evaluates student mastery in multiple formats and sets ever more challenging experiences</li> </ul>	<ul style="list-style-type: none"> <li>• Equitable access technology to all students anytime, anywhere</li> <li>• 100% of students use technology to develop 21<sup>st</sup> century skills</li> <li>• All students have the opportunity to achieve and to receive remediation</li> </ul>	<ul style="list-style-type: none"> <li>• 100% of schools and districts systematically use external and conduct internal research</li> <li>• 100% of teachers and administrators to collect and manage data to guide decisions and inform continuous improvement</li> </ul>	<ul style="list-style-type: none"> <li>• Use technology to set policies, procedures, analyze performance, report and communicate with constituencies</li> <li>• Use technology to manage continuous improvement</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Parents</b> Actively involved in defining educational objectives, setting individual student learning plans and able to view results via privacy protected web tools</li> <li>• <b>Community</b> Involved in defining educational objectives and informed of results and district level interventions via privacy protected web tools</li> </ul>

## About the STaR Chart A Tool for Assessing School Technology and Readiness

The STaR Chart can help any school or community answer some critical questions:

- **Is your school using technology effectively to ensure the best possible teaching and learning?**
- **What is your school's current education technology profile?**
- **What criteria should be used in judging your progress?**

First released in 1997, the STaR Chart was created by the CEO Forum to provide a clear framework for understanding how well schools are prepared to equip students with the knowledge and skills they need to thrive in today's information technology economy. The STaR Chart is a tool that can help all schools create and implement a plan for improving education with the help of information technology. Over the past year, education leaders nationwide have used the STaR Chart as a road map to help understand and plan for the integration of education and technology. Here are some of the ways the STaR Chart has been put to use:

- **Setting benchmarks and goals** Schools, districts, and states have used the STaR Chart to identify current education technology profiles, establish goals, and measure their progress.

- **Applying for grants** The STaR Chart has helped schools and school districts identify their education technology profiles and objectives as they apply for technology-related grants.

- **Determining funding priorities** Education leaders have also used the STaR Chart to help determine where to allocate funds to fill gaps.

- **Creating assessment tools** Education policymakers have used the STaR Chart to help construct their own state technology assessments.

The new Year 4 STaR Chart provides a look at Student Achievement and Assessment, ranging from "Early Tech" to "Target Tech."

**Schools and districts should focus on the key building blocks for student achievement in the 21st century- assessment, alignment, accountability, access and analysis- to ensure technology boosts student learning and improves education.**

**Access** The ability or right for all students to make use of education technology.

**Accountability** Holding people and institutions responsible for their, or their institutions, performance in meeting defined objectives

**Alignment** The clear lineation and linkage of instructional resources and tools, including technology, and assessment to support standards and educational objectives

**Analysis** The research, development and study of education technology, specifically on the link between the effective use of education technology to achieve educational objectives and student

achievement

**Assessment** The means of evaluating student performance, skills and knowledge. Assessment takes place in two forms. Formative assessment occurs on an ongoing basis as part of the instructional process and provides opportunities to revise or adjust instruction accordingly. Summative assessment occurs at the end of projects, courses or grade levels and can include educator, school or district designed evaluations and tests or state mandated standardized short answer and multiple-choice tests

### **The Stages of Professional Development**

In defining professional development profiles, the Year 4 STaR Chart builds upon the five phases of professional development identified by Apple Classrooms of Tomorrow (ACOT) through a decade of research on the instructional changes that occur during the process of integrating technology to transform the learning environment:

- **Entry** Educators struggle to learn the basics of using technology.
- **Adoption** Educators move from the initial struggles to successful use of technology on a basic level (e.g., integration of drill and practice software into instruction).
- **Adaptation** Educators move from basic use to discovery of its potential for increased

productivity (e.g., use of word processors for student writing, and research on the Internet)

- **Appropriation** Having achieved complete mastery over the technology, educators use it effortlessly as a tool to accomplish a variety of instructional and management goals.

- **Invention** Educators are prepared to develop entirely new learning environments that utilize technology as a flexible tool. Learning becomes more collaborative, interactive and customized.

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### Founded in 1996, the CEO Forum on

Education & Technology is a unique five year partnership between business and education leaders who are committed to assessing and monitoring progress toward integrating technology in America's schools. The CEO Forum hopes to ensure that the nation's students will achieve higher academic standards and will be equipped with the skills they need to be contributing citizens and productive workers in the 21st century.

### Organizing Principles

- All students must graduate with the technology skills needed in today's world and tomorrow's workplace.
- All educators must be equipped to use technology as a tool to achieve high academic standards.
- All parents and community members must stay informed of key education technology decisions confronting policymakers, administrators and educators.
- All students must have equitable access to technology.
- The nation must invest in education technology research and development.

### The CEO Forum Four Year Agenda

**Year 1: The School Technology and Readiness Report: From Pillars to Progress** (October 1997)

The first report issued by the CEO Forum focused on the importance of integrating all the elements of education technology, from hardware and connectivity to professional development and content.

- STaR Chart, a self-assessment tool for schools to gauge progress toward integrating technology to improve education.
- STaR Assessment, a benchmark measure of national progress toward integrating technology in schools.

**Year 2: Professional Development: A Link to Better Learning** (February 1999)

This second year report focused on educator professional development, the foundation for effective use of technology in education.

- Ten Principles for Effective Professional Development
- STaR Chart Update
- STaR Assessment Update

**Year 3: The Teacher Preparation STaR Chart: A Self-Assessment Tool for Colleges of Education** (January 2000)

This self-assessment tool enabled colleges of education to determine their institution's level of readiness in preparing tomorrow's teachers to integrate educational technology into instruction.

**The Power of Digital Learning: Integrating Digital Content** (June 2000) This report offered a vision for digital learning and focuses on the actions that schools, teachers, students and parents must take to integrate digital content into the curriculum to create the learning environments that develop 21st century skills.

- Creating a Digital Content Strategy
- STaR Chart Update

**Year 4: Education Proposals Must Be Included in Comprehensive Education Legislation** (March 2001) This policy paper provided recommendations regarding education technology for the federal government.

**Key Building Blocks for Student Achievement in the 21st Century: Assessment, Alignment, Accountability, Access and Analysis** (June 2001) The final CEO Forum report focuses on the important educational objectives that can be achieved through the effective use of education technology. It also highlights the changes in alignment, assessment, measurement, continuous improvement and research needed to ensure technology produces positive results in education.

- STaR Chart Update



**Appendix V: Information literacy skills/ Academic Content Standards**

*Education Technology Planning: A Guide for School Districts:* Appendix B

<http://www.cde.ca.gov/ctl/edtechplan/appendixes.pdf>

Academic Content Standards for California Public Schools

<http://www.cde.ca.gov/standards/>

**Appendix VI: ISTE National Education Technology Standards (NETS)**

<http://cnets.iste.org/>

## **Appendix VII: Current state-administered technology resources**

**California Learning Resource Network (CLRN).** CLRN services include the review of supplemental electronic learning resources (including software, on-line resources, and video) and on-line model technology lessons for alignment with the State Board-adopted Academic Content Standards. The review criteria used in this process were approved by the State Board of Education. The goal is to provide a comprehensive instructional delivery package that combines standards-aligned resources and standards-based lesson plans in a single, easy-to-use access point. The searchable website includes the review results of the resource evaluation, the standards-based instructional lessons, and links to other resources. Refer to the website at <http://www.clrn.org>.

**California Student Information System (CSIS).** CSIS builds the capacity of Local Education Agencies (LEAs) to implement and maintain comparable, effective, and efficient student information systems that supports local education agency (LEA) daily program needs and promotes the use of information for educational decision-making by school-site, district office and county staff. It enables the accurate and timely exchange of student transcripts between LEAs and post secondary institutions. CSIS assists LEAs with the transmittal of state reports electronically to the California Department of Education, thereby reducing reporting burden of LEA staff.

**California Technology Assistance Project (CTAP).** CTAP works collaboratively with all school districts and county offices of education, through a network of eleven regions statewide, to meet locally defined technology-based needs. CTAP regional staff provide assistance in the areas of staff development; learning resources; hardware telecommunications infrastructure; technical assistance to school districts in developing a support system to operate and maintain an education technology infrastructure, including improving pupil record keeping and tracking related to pupil instruction; coordination with federal, state, and local programs consistent with State Board-adopted Academic Content Standards; and funding for technology. Refer to the website at <http://www.cde.ca.gov/edtech/ctap.htm>.

**Digital California Project (DCP).** DCP provides California's K-12 education community with access to the high speed, high bandwidth on-line network currently available to higher education. DCP is designed to build the necessary network infrastructure needed to provide districts with at least one access point in each county to the high-speed statewide network. Refer to the website at <http://www.cenic.org/CDP.html>.

**Technical Support for Education Technology in Schools (TechSETS).** This project provides professional development and resources for technology staff. Services include identifying technology skills needed, along with appropriate professional development, arrayed in a user-friendly matrix; identifying cost effective sources of training aligned to the matrix of skills; providing resources and support for California school technologists through an online interactive helpdesk, and providing assistance for planning and installing technology infrastructures. Refer to the website at <http://www.techsets.org>.

**Technology Information Center for Administrative Leadership (TICAL).** TICAL provides assistance for district and site administrators by providing professional development focused on "digital school leadership" for educational administrators in the areas of: data-driven decision making, integrating technology into standards-based curriculum, technology planning, professional development needs of staff, financial planning for technology, and operations and maintenance. Professional development is conducted through a series of workshops provided by TICAL cadre members throughout the state. TICAL maintains a web portal that features hundreds of resources that have been reviewed and recommended by practicing administrators to assist with digital school leadership. The portal is frequently augmented with current content that provides just-in-time assistance for administrators and is also used as the dissemination vehicle for information on upcoming professional development workshops. Refer to the website at <http://www.portical.org>.

**CTAP<sup>2</sup> Technology Assessment Profile.** CTAP<sup>2</sup> is an on-line, self-assessment data collection tool that allows school administrators to gather information on their staffs technology proficiency and use of technology for instruction. The website includes two administrative tools. The Proficiency Assessment is an on-line, self-assessment tool that allows educators to determine their level of technology proficiency. The self-assessment is based upon rubrics established in each area of technology competency and aligned with the California Commission on Teacher Credentialing (CTC) "Factors to Consider", which is the Technology Standard for a California K-12 Preliminary Teaching Credential. Based on the results of the assessment, educators can view and select training opportunities that will advance their proficiency. While the results for the individual teacher are private, charts can be displayed showing the overall level for teachers at a school site as well as within a district, county, region, or for the entire state. The Technology Use Survey is an on-line tool that allows site, district, county and state administrators to gather information regarding certificated staff's use of technology tools. The survey addresses four areas of teacher technology usage: 1) use of technology tools for classroom management and instruction; 2) their student's use of technology tools for classroom assignments; 3) their professional development preferences, and 4) their technical support experiences. Refer to the website at <http://ctap2.iassessment.org>.

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